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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,079	02/21/2002	Rolf Gunter Erich Stegelmann	10157	2341
26890	7590	06/09/2004	EXAMINER	
JAMES M. STOVER NCR CORPORATION 1700 SOUTH PATTERSON BLVD, WHQ4 DAYTON, OH 45479			WASSUM, LUKE S	
			ART UNIT	PAPER NUMBER
			2177	

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/081,079		STEGELMANN ET AL.	
	Examiner		Art Unit	
	Luke S. Wassum		2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Invention

1. The claimed invention is a database system including components for executing stored procedures that include at least one of a conditional expression, assignment expression, and dynamic database query language (e.g., SQL) statement, wherein low-level code is generated for each such expression, and inserted into the object code of the corresponding stored procedure.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 14 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Regarding claim 14, the limitation that the database query language statement is not one of the predetermined expressions renders the claim indefinite, since the corresponding independent claim 1 specifically differentiates the 'expression' part of the stored procedure from the 'database query language statement' part. Since the database query language statement is not the expression, it certainly cannot be one of the predetermined types of expressions.

5. Regarding claim 17, the claim recites the limitation that the database system submits a query language statement to the database system. Since having the database system submit a statement to itself is at the least confusing, the claim is rendered indefinite.

6. Claims 18 and 19, incorporating the deficiencies of parent claim 17, are likewise rejected.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Chow et al. (U.S. Patent 5,875,334).

9. Regarding claim 1, Chow et al. teaches a method of executing a stored procedure in a database system as claimed, the stored procedure containing at least an expression and a database query language statement, the method comprising:

- a) identifying the expression in the stored procedure, the expression being according to one of plural predetermined types of expressions (see col. 8, lines 7-10);
- b) generating low-level code representing the expression (see col. 8, lines 18-27); and

- c) generating an object representing the stored procedure, the object containing the low-level code and one or more instructions representing the database query language statement (see col. 8, lines 27-32).

10. Regarding claim 15, **Chow et al.** teaches an article comprising at least one storage medium containing software as claimed, that when executed cause a database system to:

- a) generate object code corresponding to a stored procedure having at least a first type expression and a second type expression, the first type expression selected from the group consisting of a conditional expression, an assignment expression and a dynamic database query language statement (see col. 8, lines 7-27);
- b) create a predetermined type of code corresponding to the first type expression (see col. 8, lines 7-27);
- c) provide the predetermined type of code in the object code to represent the first type expression (see col. 8, lines 7-27); and
- d) provide one or more instructions representing the second type expression in the object code, the instructions different from the predetermined type of code (see col. 8, lines 27-32).

11. Regarding claim 23, **Chow et al.** teaches a database system as claimed, comprising:

- a) a plurality of nodes (see disclosure of client and server, col. 3, lines 15-19);
- b) an evaluator module in a first one of the plurality of nodes (see disclosure that the stored procedure is invoked from the client, col. 4, lines 10-16);

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- c) an access module in a second one of the plurality of nodes, the access module to manage access to a portion of data stored in the database system (see disclosure that the statement is executed on the server, col. 3, lines 15-19); and
- d) a controller in the first node adapted to execute a stored procedure object code, the object code containing a first type of code to represent an expression that is one of a conditional expression, an assignment expression and a dynamic statement, the object code containing a second, different type of code to represent a database query language statement (see col. 8, lines 7-27),
- e) the controller adapted to submit the first type of code to the evaluator module to evaluate the expression (see col. 8, lines 7-27; see also disclosure of the separate PGM pointer for the 'procedural part' and the pointer to the executable plan for the query statement, col. 31, line 22 through col. 32, line 2); and
- f) the controller adapted to submit a command corresponding to the database query language statement to the access module (see col. 3, lines 15-21; see also disclosure of the separate PGM pointer for the 'procedural part' and the pointer to the executable plan for the query statement, col. 31, line 22 through col. 32, line 2).

12. Regarding claim 27, Chow et al. teaches an article comprising at least one storage medium containing instructions for use in a database system as claimed, the instructions when executed causing the database system to:

- a) access object code in response to invocation of a stored procedure, the object code containing first type of code representing an expression and a second type code representing a database query language statement (see col. 8, lines 7-27);

- b) submit the first type code to an evaluator module to evaluate the expression (see col. 8, lines 7-27); and
- c) submit a command corresponding to the database query language statement to an access module to access data specified by the database query language statement (see col. 3, lines 15-21).

13. Regarding claims 2 and 16, **Chow et al.** additionally teaches a method and article further comprising directly executing low-level code at run-time to evaluate the expression (see col. 27, lines 14-22).

14. Regarding claim 3, **Chow et al.** additionally teaches a method wherein directly executing the low-level code is performed in place of submitting a database query language statement to evaluate the expression (see col. 8, lines 7-27).

15. Regarding claim 4, **Chow et al.** additionally teaches a method wherein directly executing the low-level code consumes less database system resources than submitting a database query language statement to evaluate the expression (see col. 8, lines 42-48).

16. Regarding claims 5 and 18, **Chow et al.** additionally teaches a method and article further comprising:

- a) submitting the low-level code to an evaluator module to evaluate the expression (see col. 8, lines 7-27); and

- b) submitting a command corresponding to an access module in the database system to access data specified by the database query language statement (see col. 3, lines 15-21).

17. Regarding claim 6, Chow et al. additionally teaches a method wherein the database system has a first node containing a parsing engine and the evaluator module (see col. 8, lines 7-27) and a second node containing the access module (see disclosure that the statement is executed on the server, col. 3, lines 15-19), wherein submitting the command is performed by the parsing engine (see col. 8, lines 7-27).

18. Regarding claim 7, Chow et al. additionally teaches a method further comprising:

- a) storing information pertaining to a variable and a constant used in the expression with the low-level code in the object (see col. 18, lines 25-60);
- b) executing the low-level code during execution of the stored procedure using an evaluator module (see col. 27, lines 58-60); and
- c) using the information pertaining to the variable and constant during execution of the low-level code to evaluate the expression (see col. 30, lines 27-52).

19. Regarding claim 8, Chow et al. additionally teaches a method wherein identifying the expression comprises identifying one of a conditional expression, an assignment expression and a dynamic database query language statement (see col. 8, lines 7-27).

20. Regarding claim 9, Chow et al. additionally teaches a method further comprising:

- a) identifying a second expression in the stored procedure that is one of a conditional expression, an assignment expression, and a dynamic database query language expression (see col. 8, lines 7-27); and
- b) generating second low-level code to represent the second expression, wherein generating the object comprises providing the second low-level code in the object (see col. 8, lines 7-27).

21. Regarding claim 10, **Chow et al.** additionally teaches a method wherein generating the object comprises generating the object containing the low-level code that is different from the instructions representing the database query language statement (see col. 7, lines 50-65).

22. Regarding claim 11, **Chow et al.** additionally teaches a method wherein generating the low-level code comprises generating assembly code (see disclosure that the procedural and non-procedural parts of the stored procedure are run through compilers, col. 7, line 66 through col. 8, line 6).

23. Regarding claim 12, **Chow et al.** additionally teaches a method further comprising:
- a) storing the object in a predetermined location (see col. 4, lines 8-15); and
 - b) accessing the predetermined location to retrieve the object in response to invocation of the stored procedure (see col. 4, lines 8-15).

24. Regarding claim 13, Chow et al. additionally teaches a method wherein storing the object in the predetermined location comprises storing the object in a stored procedure table (see col. 4, lines 8-15).
25. Regarding claims 14 and 20, Chow et al. additionally teaches a method and article further comprising:
- a) executing the object, wherein executing the object comprises submitting the low-level code to an evaluator module to execute the low-level code wherein the database query language statement is not one of the predetermined types of expressions (see disclosure of the separate PGM pointer for the 'procedural part' and the pointer to the executable plan for the query statement, col. 31, line 22 through col. 32, line 2); and
 - b) executing the one or more instructions representing the database query language statement without submitting the one or more instructions to the evaluator module (see disclosure of the separate PGM pointer for the 'procedural part' and the pointer to the executable plan for the query statement, col. 31, line 22 through col. 32, line 2).
26. Regarding claim 17, Chow et al. additionally teaches an article wherein the software when executed causes the database system to submit a database query language statement in the second type expression to the database system to evaluate the second type expression (see col. 3, lines 8-35).
27. Regarding claim 19, Chow et al. additionally teaches an article wherein the software when executed causes the database system to provide the predetermined type of code to the object code generator to add the object code (see col. 8, lines 7-27).

28. Regarding claims 21 and 25, **Chow et al.** additionally teaches a database system and article wherein the predetermined type of code corresponding to the first expression includes machine-level code (see disclosure that the procedural and non-procedural parts of the stored procedure are run through compilers, col. 7, line 66 through col. 8, line 6), and wherein the instructions representing the second type expression includes C code (see col. 1, lines 54-62).

29. Regarding claim 22, **Chow et al.** additionally teaches an article wherein the second type of expression comprises a Structured Query Language (SQL) statement (see SQL statements in the stored procedure listed at col. 4, lines 17-32).

30. Regarding claim 24, **Chow et al.** additionally teaches a database system wherein the controller comprises a parsing engine (see disclosure of parser at col. 8, lines 7-27).

31. Regarding claim 26, **Chow et al.** additionally teaches a database system wherein the first type code contains information identifying a type of the expression and a variable and constant used by the expression (see disclosure of variable bind-in, col. 5, line 49 through col. 6, line 36).

32. Regarding claim 28, **Chow et al.** additionally teaches an article wherein the instructions when executed cause the database system to generate the first type code for the expression being one of a conditional expression, assignment expression and dynamic statement, and provide the first type code in the object code (see col. 8, lines 7-27).

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33. Regarding claim 29, **Chow et al.** additionally teaches an article wherein the instructions when executed cause the database system to generate the second type code which is different from the first type code, and provide the second type code in the object code (see disclosure that there are procedural and non-procedural parts of the stored procedure, col. 7, line 66 through col. 8, line 6).

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Li et al. (U.S. Patent 5,794,231) teaches a method for treating an embedded static SQL program that resides within the CLI application in an analogous manner to stored procedures.

Singh et al. (U.S. Patent 6,477,540) teaches the ability to utilize Java as a stored procedure.

Kabra et al. (U.S. Patent 6,507,834) teaches a method of parallel execution of SQL operations from stored procedures.

Kabra et al. (U.S. Patent 6,732,084) teaches a method of parallel execution of trigger actions.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke S. Wassum whose telephone number is 703-305-5706. The examiner can normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner at 703-746-5658.

Customer Service for Tech Center 2100 can be reached during regular business hours at (703) 306-5631, or fax (703) 746-7240.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luke S. Wassum
Art Unit 2177

lsw
8 June 2004